

## REPORT OF MONITORING ACTIVITIES 11-06-2001

Following is a compilation, by geographic area, of fire effects monitoring and research activities that BLM Alaska Fire Service conducted, assisted, or consulted with during FY2001. Activities with field work conducted by AFS in 2001 are denoted by \*.

### MILITARY ZONE:

1. Shannon Park fire photopoints. \* Photopoints were established to follow vegetation recovery on a 12-acre wildfire (B196, 1999) which burned on Ft. Wainwright adjacent to the Shannon Park subdivision. A photo comparison of the first 2 years of revegetation was prepared (Fire Effects data drawer). Digital photos were taken and have been stored on CD. (Tami DeFries, Randi Jandt)

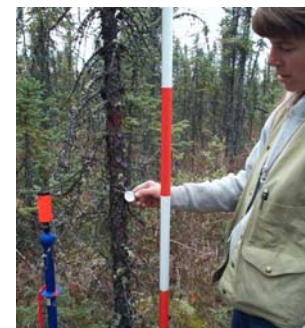
2. Ft Wainwright area Shaded Fuel Breaks. \*Shannon Park: Treatment was completed in 2000, burning was completed in 2001. Also this year, 3 permanent 30-m transects were established to document vegetation effects. Badger Gate treatment was completed in spring and debris piles burned in fall of 2001. Photos of the prescribed burn are stored in V:\Public\FUELS\Jennifer\BadgerRX Photos. (Tami Defries, Hank Falcon, Chris Hays, Jennifer Allen, Randi Jandt) Spot measurements of duff moisture and frost depth at a couple locations suggested that the fuel break treatment may be having an impact on thaw rates and depths, which may cause duff to become drier by late summer in opened stands. Preliminary findings are presented in an report **"Shaded fuel break hazard fuel reduction projects: monitoring 2001"** by Allen/Jandt available from the Military Zone.



3. Fire B247 Duff Consumption. \* Considerable effort has been placed into setting duff consumption plots out in proposed burn areas, but the success of burning those areas in order to get the paired data has been low. With help from the Division of Forestry and NFO, we assisted the PNW crew (Ottmar) in locating 3 new sets of duff consumption plots—2 on B247 and 1 on B246. Post burn duff reduction measurements were successfully recorded at 2 of the sites. PNW is using the data in predictive models for fire severity and for emissions. One of two permanent vegetation recovery transects that were placed also burned (Jandt/Allen/Howard). Several university research groups have expressed interest in monitoring various aspects of fire effects and recovery on this burn, due to the location near the Bonanza Creek experimental forest and ease of access. Depending on the success of grant proposals, we may be able to do more intensive monitoring on this burn. ADF&G also has landscape-scale monitoring planned of area actually burned and stand changes associated with the recovery (Paragi).

4. Manchu prescribed burn area \*. Plots for duff consumption (USFS-PNW) were refreshed in anticipation of burning during 2001, but the burn was not accomplished due to planning constraints and fire activity on the Military Zone. Duff and foliar fuel moistures were tracked periodically throughout the summer and compared to indices predicted from Fairbanks, Eielson, and a portable RAWs (Allen, Falcon, Jandt). Partial results are included in a report **"Fuel & Duff Moisture Monitoring in 2001"** available from Fuels Management office.

5. Fuels Demonstration Project: Shaded Fuel Breaks (sponsored by Joint Fire Science Program)\*. AFS and Tanana Chiefs Conf. (TCC) completed pre- and post- treatment measurements, as well as thinning and pruning treatments on two of the 5-acre demo sites covered under an interagency agreement. The AFS-treated black spruce stand is located on Dennis Road, outside Badger Gate and TCC treated a site on Togothele Native Corporation lands near Nenana. A poster and progress report was prepared for JFSP by Bob Ott (TCC). Monitoring at the site is intended to determine stand and forest floor changes that will modify fire behavior at similar operationally treated sites. (Jennifer Allen, Randi Jandt, Sean Phillips)



6. Ft. Greeley B222-1999. The Army DPW Environmental Resource Division continues to survey post-fire vegetation recovery, using their Land Condition Trend Analysis (LCTA) methodology (Clark/Mason). UAF researchers are also looking at various fire effects there, including tree seedling regeneration (Johnstone) and CO<sub>2</sub> flux (Chapin). Much of B222 burned with high to

moderate severity.

#### TANANA ZONE:

1. The Zone was relatively quiet for fire activity and zone personnel provided a significant percentage of the work force to complete the activities noted in the rest of this report, especially in the Military Zone.

#### GALENA ZONE:

1. Imuruk Lake Long Term Fire Effects in Tundra study\*. This project was supported by the Fire Effects Task Group under AWFCG and covered by a cooperative assistance agreement (#LBI012006). CRREL, AFS, and NFO jointly relocated and surveyed 7 permanent transects which were deployed after a 1977 tundra fire on the Seward Peninsula. Vegetation information and thaw depths had been collected in 1973 (pre-burn), 1978, 1979, 1989 and preliminary succession data was published by Chuck Racine. The data is being compiled by Racine, and photos are with the Northern Field office. A report will be completed in 2002.

#### UPPER YUKON ZONE:

1. Satellite imagery to map burn severity\*. The NPS is working to refine techniques using remote sensing to map burn severity and is working with Upper Yukon Zone and Fuels Management on coordination and logistics (Henderson, NPS/Howard, AFS).

#### OTHER:

1. Tanacross Shaded Fuel Break (AA39)\*. The project is described and pictured in BLM Snapshots, September 10, 2001. Three permanent monitoring plots for stand modification (thinning) and understory vegetation change over time were placed prior to treatment using modified FMH protocols. Before treatment, the stands averaged 1,811 stems/acre, mainly white and black spruce (1,562/acre) with scattered aspen and a canopy cover of about 60%. Canopy cover had been reduced by half (30%) near the school in the first treated unit. Post-treatment data will be collected beginning in 2002. (Musitano/Hernandez/Jandt/Anderson -volunteer)



2. Although the Alphabet Hills prescribed burn project \* did not come into prescription this summer, additional vegetation monitoring plots were deployed, duff moisture was measured on at least one occasion (Allen). The GFO archaeologist deployed temperature sensing probes in anticipation of a burn, designed to gather data on potential fire impact on archaeology sites (Allen, Muenster). With the assistance of Tim Hammond and Mark Shasby (EROS Data Center), Landsat 7 imagery was previously obtained and is ready to be classified for comparison with post-burn imagery for monitoring landscape-level effects when the burn is accomplished.

3. Chena Lakes Flood Control Project: Post-burn monitoring of AA25\*. This project was crushed by bulldozer, then burned 3 years later in 1998, with an unburned control. The objective was to see which treatment was more successful in regenerating hardwood browse. Monitoring continued the third season following the burn treatment, in cooperation with the Army COE, and browse regeneration continues to be poorer on

the burn than on the control. The greatest amount of browse lies on the scarified fire break line at this point. (Jandt, Everett)

4. Chena Lakes Flood Control Project (Remote Arm AA50): Six permanent transects were previously deployed to monitor success of burn treatment objectives using modified Fire Monitoring Handbook (FMH) technique in 3 different treatments (burn, hand cut and burn, mechanical crush and burn). Objectives are to limit encroachment of woody species and maintain a grass cover over the silt blanket in the overflow area. The prescribed burn was ignited in May and burned most of the target area, but failed to penetrate into some of the brushier interior where transects were located. Half (3) of the transects burned and data was recorded on burn severity. Post-burn regeneration of brush and grass will be evaluated beginning in 2002. Starting relative cover of



bluejoint grass was 19% and the density of hardwood stems was 18,667 stems/ha on the 6 transects.

5. Chena Lakes Flood Control Project (F-Unit AA38)\*: Pre-burn vegetation and frost data collection on this proposed prescribed burn was previously (2000) conducted using modified FMH forest protocols (3 transects). In 2001, the PNW research team (Ottmar) added 18 duff consumption plots for fire severity and emissions. Fuel moistures in the unit were monitored by AK-350 staff (Higgins) all season, but the burn was not accomplished this field season. We placed conductivity probes in the duff near moisture sampling sites to see if trends could be monitored in this manner, but our first trial yielded some confusing results. We have sought assistance from the UAF Dept of Water Resources (Hinzman) in further exploring the use of probes for duff moisture, and jointly submitted a grant proposal to JFSP with the Northern Field Office.

6. Tree ring studies \*: Tree “cookies” have been collected by AFS personnel in the field for several field seasons and provided to Dr. Glenn Juday at UAF for analysis. Results of some of the analysis were presented by Dr. Juday and a fall “mini-symposium” of the Long Term Ecological Research group in November, 1999 and in a paper published in 2000 (Barber, et al. 2000). Among his findings are that white spruce in interior Alaska is demonstrating drought stress and poor growth since late 1970's brought on by warmer conditions. Tree cookies were collected from site of proposed prescribed burn at Chena Lakes to determine fire return interval, from two Fuels Demo sites, and from a large fire history project in the White Mountains Recreation Area (Allen/ Herriges).

7. Duff Moisture Sampling project \* Brenda Wilmore (now with USFS) completed and published her M.S. Thesis on measured duff moisture vs. CFFDRS indices (Wilmore, 2001). She conducted an extensive literature review which has been consolidated into the interagency electronic bibliography (Kraft), along with a methods handbook on collecting fuel moisture samples from duff and the use of moisture probes. We continued to collect fuel moisture samples from project sites (above) using these methods and the results are compiled in report “**Fuel & Duff Moisture Monitoring in 2001**” available from Fuels Management office.

8. Alaska Fire Effects On-Line Bibliography Project: with support of the fire effects task group of the AWFCG Research Committee, material was collected for an searchable online bibliography which includes many unpublished papers, posters, and other data collections on work in Alaska. The bibliography is hosted under “Fire Effects” at AFS external website <http://fire.ak.blm.gov/> (Randi Jandt, Alex Clarke, Steve Kraft)

9. Frostfire: Symposium in September, 2001 presented research results from numerous disciplines following the research prescribed burn of June, 1999. Research continues under the leadership of the Long Term Ecological Research team at UAF. Findings will continue to be published and presented at scientific meetings. A list of relevant publications is available through their website at <http://www.lter.uaf.edu/>. Selected posters from the symposium have been displayed and are housed in the AFS library.

#### Citations:

Barber, V.A. Juday, G.P. and B.P. Finney. 2000. Reduced growth of Alaskan white spruce in the twentieth century from temperature-induced drought stress. *Nature* 405:(Letters)668-673.

Wilmore, B. 2001. Duff moisture dynamics in black spruce feather moss stands and their relation to the Canadian Forest Fire Danger Rating System. M.S. Thesis Univ. of Alaska-Fairbanks. 105pp.